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The Snowball Effect of Climate Change

The current climate crisis is primarily driven by the emission of greenhouse gases (GHG), most notably from the combustion of fossil fuels. Reducing greenhouse gas emissions is the key to slowing down climate change and eventually restoring atmospheric GHG concentrations to pre-global warming levels. Unfortunately, the global warming effect associated with climate change is likely to cause an increase in energy use through increased air conditioning in summer months. This will generate more GHG emissions and increase the effects of climate change even further. This cycle must be broken to escape the climate crisis.

One of the significant effects of climate change is an increase in the average surface temperature of the Earth. Since 1901, the average surface temperature across the U.S. has increased by an average of 0.16°F per decade.¹ Even larger shifts have been observed in the most recent decades, with increases of up to 0.54°F per decade.¹ One consequence of global warming is increased energy use in the summer, largely from additional use of air conditioning, which accounts for roughly 20% of electricity use in the average American household.² Summer electricity use has nearly doubled since 1973 for the average American household, in part due to increased temperatures from global warming and the increased use of central air conditioning.² A reduced need for heating in the winter is expected to slightly offset the increased need for cooling in the summer, however a net increase in overall energy use is expected.²

Electricity generation produces around 25% of all greenhouse gas emissions from human activities.³ Approximately 60% of our electricity nationwide is produced from burning fossil fuels, although this varies significantly by region.³ With increased temperatures leading to more electricity use and an increase in greenhouse gas emissions, climate change will continue to worsen in a cyclical process. The further this snowball effect continues, the harder it will be to reverse.

The key to stopping this cycle lies within the generation sources for electricity and the amount of electricity consumed. Improved efficiency for electricity generation, transmission, storage and consumption will help minimize the resources used in this manner, thus reducing GHG emissions from the combustion of fossil fuels. Utilizing renewable resources is also a major component of reducing GHG emissions from electricity generation by replacing fossil fuels. All of these strategies will be needed to reduce GHG emissions quickly, which is of extreme importance to ending the cycle. Greenhouse gases are estimated to remain in the atmosphere for a few years up to thousands of years, depending on the gas.⁴ The longer it takes to reach net-zero GHG emissions, the longer it will take to stop the effects of climate change. This is the reason for aggressive timelines to achieve net-zero GHG emissions, such as from [Executive Order \(EO\) 14057: Catalyzing Clean Energy Industries and Jobs Through Federal Sustainability](#). This EO calls for net-zero emissions nation-wide by 2050, with goals for carbon-pollution free electricity for the Federal Government as soon as 2030.⁵ For a few tips on how you can contribute to achieving net-zero emissions, please read this month's [Take Action article](#).

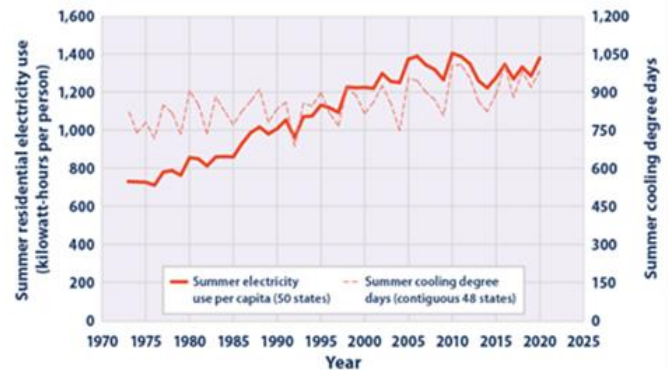


Figure 1. Residential summer electricity use and summer cooling degree days in the U.S. from 1973-2020.²

SPOTLIGHT



2022 NIH Freezer Challenge Results

The 2022 NIH Freezer Challenge recently concluded on May 15, 2022. This year's Challenge again called for NIH labs to go above and beyond the NIH Freezer Management Policy by completing one or more initiatives. See the results inside!

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TAKE ACTION



Quick Tips for Reducing Your Electricity Use

Reducing greenhouse gas (GHG) emissions is crucial for reversing the current climate crisis. One of the primary ways to reduce emissions is to reduce electricity consumption. Read the full article for some quick tips to accomplish this!

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NEMS TRAINING

Did you know? The monthly electricity cost for the Bethesda campus during the summer has surpassed \$2,000,000! To learn more about electricity conservation at the NIH, please visit the [NEMS Training webpage](#) to view a short (20 minute) NIH environmental awareness training video.